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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

VU, DAVID

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/614,489

Applicant(s)

BASCERI ET AL.

Examiner

DAVID VU

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>07/03/03; 10/20/03; 02/17/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 9 and 10 are rejected under 35 U. S. C. 102(b) as being anticipated by Summerfelt et al. (US Pat. 5,781,404, herein after Summerfelt).

Regarding claims 1, 2 and 9, Summerfelt discloses in fig. 5 a method of forming a BST film over a substrate assembly, comprising: forming a first electrode material 30 over the substrate assembly; forming a nucleation layer 32 over the first electrode material 30; forming a BST film 34 over the nucleation layer 32; forming a second electrode material 46 over the BST film 34; wherein the nucleation layer 32 is a metal selected from the group consisting of: Nb and Mn (col. 4, lines 16-24 and TABLE 2).

Regarding claim 3, Summerfelt discloses the electrode 30 is Pt. (TABLE 2).

Regarding claim 4, Summerfelt discloses the nucleation layer (ST layer 32) is 20Å (2nm) thick (TABLE 1).

Regarding claim 10, Summerfelt discloses that the nucleation layer 32 is formed directly over the first electrode material 30 (fig. 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5, 6 and 14 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Summerfelt et al. (US Pat. 5,781,404) in view of Kawahara et al. (US Pat. 6,117,482, herein after Kawahara)

Regarding claim 5, Summerfelt fails to disclose the claimed deposition rate of the BST film. However, Kawahara teaches in col. 3, lines 10-14, the BST film is deposited at a rate of about 30Å/min. It would have been obvious to one with ordinary skill in the art at the time of the invention to form a BST layer at a low deposition rate as taught by Kawahara in the process of Summerfelt in order to produce a more uniform and stable BST film.

Regarding claims 6 and 14, it would have been obvious to one with ordinary skill in the art at the time of the invention to form a BST layer as taught by Kawahara in the process of Summerfelt since the deposition rate is well known processing variable and the discovery of the optimum or workable range involves only routine skill in the art.

3. Claims 7, 8, 11-13 and 15 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Summerfelt et al. (US Pat. 5,781,404) in view of Ueda et al. (US Pat. 6,285,051, herein after Ueda)

Regarding claims 7, 8, 11 and 12, Summerfelt fails to disclose the BST film composition. However, Ueda teaches in col. 3, lines 12-15, the BST film contains 50-60% of Ti atoms. It would have been obvious to one with ordinary skill in the art at the time of the invention to form a BST layer containing a large number of Ti atoms as taught by Ueda in the process of Summerfelt, the motivation being to obtain the advantage/benefit taught by Ueda, i.e., to suppress the leakage current to a large degree (See ABSTRACT).

Regarding claim 15, Summerfelt fails to disclose raising the temperature of the substrate as set forth in this claim. However, Ueda teaches in col. 8, line 65 through col.9, line 13, the substrate temperature is raised from 600-650°C. It would have been obvious to one with ordinary skill in the art at the time of the invention to raise the substrate temperature as taught by Ueda in the process of Summerfelt, the motivation being to obtain the advantage/benefit taught by Ueda, i.e., to increase the content of Ti in the BST film. Although the Ueda range is slightly higher than the claimed range (i.e., 100°C), this does not define patentable over Summerfelt in view of Ueda since the temperature is well known processing variable and the discovery of the optimum or workable range involves only routine skill in the art.

Regarding claim 13, Summerfelt fails to disclose the claimed thickness of the BST film. However, Ueda teaches in col. 7, lines 1-2, the BST layer is 29nm (290Å) thick. It would have been obvious to one with ordinary skill in the art at the time of the invention to form a BST layer as taught by Ueda in the process of Summerfelt, the motivation being to obtain the

Art Unit: 2818

advantage/benefit taught by Ueda, i.e., to reduce the leakage current. Although the Ueda thickness is slightly less than what is claim by applicant (i.e., 10\AA), this does not define patentable over Summerfelt in view of Ueda because the thickness is well known processing variable and the discovery of the optimum or workable range involves only routine skill in the art.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Vu.